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SPACE CAMPAIGN FOR THE WARFIGHTING CINCS

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

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# SPACE CAMPAIGN FOR THE WARFIGHTING CINCS

## CHAPTER 1

### INTRODUCTION

The warfighting Commanders-in-Chief (CINCs) of the unified and specified commands need to understand how space forces are employed to give the CINCs significant combat support. US Space Command has developed a joint doctrine for space control that provides concepts for employing space forces in accordance with well established principles of war. It is absolutely essential that the CINCs' campaign planning staffs know their own space capabilities and those that an adversary would use against them in a campaign, and what alternatives there are to deal with these.

This paper provides a methodology or thought process a campaign planner can use to employ his space forces along with air, land, and naval forces to achieve his strategic objectives.

Chapter II of this paper describes in detail current military space operations within a mission analysis framework.

In Chapter III, a discussion of space doctrine and its key principles is presented along with some basic tenets for space control.

Chapters IV and V lay out the methodology for planning

a space campaign for a global and regional scenario.

Finally, in Chapter VI, conclusions and observations are provided to draw everything together for the campaign planner so his overall approach to planning a space campaign will be successful.

## CHAPTER II

### SPACE OPERATIONS

Campaign planners must have a basic understanding of what space forces are, how they operate, and more importantly, what combat support capabilities they provide to air, land, and naval forces.

Essentially, military space operations are broadly grouped into four mission areas: space support, space control, force enhancement (combat support), and force application. Two other critical missions are also done with space systems -- Indications and Warning (I&W) and intelligence collection, but these are such high priority that they are normally broken out separately.

#### Space Support

Space support operations are important for a campaign planner since these operations describe how space systems achieve operational capability. These operations involve the launch, on-orbit checkout and management, and reconstitution or replenishment of space systems. The forces include the launch vehicles, the launch facilities, the satellite control network, and to a certain extent, the space surveillance network which tracks the system in orbit.

It takes manpower to put systems in space. Defense contractors build the satellites and the expendable launch

vehicles upon which they are carried into space. Teams of engineers integrate the satellite payload and the rocket and erect it all at the launch site. The actual launch is managed by mission control and monitored by the test range radars of the Eastern and Western Space and Missile Centers in Florida and California. Once launched, the worldwide space surveillance network performs an early orbit determination, verifying for mission control that the payload achieved orbit. The satellite is then cataloged and its orbital parameters are passed to the entire space surveillance network for daily acquisition. This whole process requires highly technical personnel.

There is a period of time after the satellite achieves stable orbit that it undergoes an operational checkout and the system achieves operational capability. This may take several weeks if the satellite has to be moved to a particular location in the constellation it has joined.

For a warfighting CINC and his campaign planner, it is important to understand that space support operations are vital in a prolonged global conflict. However, in a short duration regional crisis, space support operations might not be a key player due to the extended lead times in getting a satellite built and manifested on a launch platform for deployment. Basically, the campaign planner is forced to plan for the use of existing capabilities -- not those in the pipeline.



## Space Control

Not unlike the objectives of sea control and achieving air superiority, space control operations focus on preserving our own space capabilities and freedom of action in space and, if directed by the National Command Authorities (NCA), denying these space combat support capabilities to an adversary.

Space control operations are complex and therefore divided among several activities. There is the Space Defense Operations Center at Cheyenne Mountain Complex in Colorado Springs, Colorado that has a key role. A backup capability is provided by Naval Space Command's Alternate Space Defense Operations Center at Dahlgren, Virginia. Both centers use the worldwide space surveillance network to maintain the space catalog of over 7,000 objects. From the space catalog, a campaign planner gets the adversary's space order of battle.

Another capability essential for space control operations is the ability to detect interference or attack on blue or allied space systems and then direct action to counter the threat if necessary. A warfighting CINC would want to know immediately if a key combat support space capability was lost or degraded during his campaign.

Besides a concern with his own capabilities, the campaign planner needs to know when his terrestrial forces are under surveillance from enemy satellites. This product is provided in the form of a Satellite Reconnaissance Advance Notice (SATRAN) report for ground forces and satel-

lite vulnerability (SATVUL) reports for fleet assets.

As one might expect, the space control mission requires an extensive array of computers and global satellite communication capability.

In the absence of an operational US antisatellite capability, US space systems are vulnerable only to the Soviet Union since it does have an operational system and other likely antisatellite capabilities -- directed energy, radio electronic combat emitters, and a direct ascent antiballistic missile system.

For other emerging regional powers, it is unlikely that they could threaten our systems in space. They could however, target the ground stations in their area by sabotage or direct attack, thus denying us the mission data a particular system provides.

For campaign planning purposes, space control operations not only provide a space order of battle for both sides, they insure our own free access to space and protection of our vital space capabilities while denying them to an adversary, if so directed.

#### Force Enhancement (Combat Support)

Space combat support operations provide the most critical capabilities to the warfighting CINC. The operations include intelligence collection (all the national assets), precision navigation (Global Positioning System -- GPS, TRANSIT for Navy's ships), tactical warning (Defense Support Program), secure satellite communications (Defense Satellite Communications System -- DSCS, FLTSATCOM

AFSATCOM, et al), environmental monitoring or weather forecasting (Defense Meteorological Satellite Program -- DMSP), mapping, charting, and geodesy.

The CINCs are also concerned with our Indications and Warning capabilities -- e.g., the ability to detect a missile attack on theater forces as well as on the continental US.

The CINCs would also plan to request priority tasking for our national intelligence collecting assets.

#### Force Application

Force application operations would involve those forces that emerge from SDI technologies. Any space-based system would most likely concentrate on countering delivery systems (ICBMs, SLBMs) that are exoatmospheric, that is, above the atmosphere. These systems would most likely have a capability against orbiting satellites as well. Finally, a ground-based terminal defense system could be employed against reentry vehicles. Since none of these forces are operationally deployed, force application operations will not be included in the methodology presented in this paper.

To recap, a warfighting CINC should focus primarily on what space combat support capabilities are essential to support the air, land, and naval campaign in his area of operations. He should only plan for operational systems and their on-orbit spares (if attrition occurs) since the lead time to reconstitute or replenish capabilities

may be months.

A CINC's next focus would be on the impact that enemy space capabilities have on his theater operations.

As a supporting CINC, USCINCSpace would be in an advisory role -- assessing the space threat against the CINC's theater forces. USCINCSpace would be the primary agent for protecting those critical space capabilities the theater CINC must have to conduct a successful campaign.

USCINCSpace could also advise the warfighting CINC on means to deny the enemy theater use of the enemy's space capabilities, whether by operational deception, electronic warfare, or direct attack on mobile ground terminals.

It is not enough just to understand what space operations do for a warfighting CINC. He must also be knowledgeable of the governing space doctrine that guides the employment of space forces. These are operations which when they include space control have the potential to escalate the crisis significantly. This would definitely impact the warfighting CINC's ability to control escalation during his campaign.

In the next chapter, space doctrine is presented within the context of space control operations. More specifically, it is the effect of these on a warfighting CINC's campaign strategy that is most important.

## CHAPTER III

### SPACE DOCTRINE

The overarching theme that governs current US space doctrine is that we must assure our own free access to and use of space, while denying this to an adversary over the spectrum of conflict.

#### Protection

The first principle, "assured access", means that our launch sites are protected from external threats; that our space infrastructure including the defense contractors which produce our space systems and expendable launch vehicles is secure; and that the satellites once in orbit are not attacked.

Assuming that our launch sites can be adequately defended, and that the local and federal law enforcement can maintain the security of our vital civilian space infrastructure, how can we protect the satellite systems themselves?

USSPACECOM Pamphlet 2-1 suggests four methods of protection: concealment, defensive countermeasures, space-based reconstitution, and ground-based reconstitution (11:15).

Concealment involves using low observable technology to decrease the radar signature of the satellite as seen from enemy spacetrack sensors; using encrypted, jam-resist-

ant, extremely high frequency (EHF) links for communications with the satellite; and having mobile ground terminals to receive or process mission data (11:14).

Defensive countermeasures would include several means of protecting on-orbit space systems. Hardening of the satellite against electro-magnetic pulse (EMP) effects is one way. Another means is using various wavelength sensitivities for sensors that would not be vulnerable to "blinding" by directed energy transmissions from ground-based lasers. Another way is to reorient satellite antennas away from sources of jamming or using satellite cross-links to get the mission data to users. It is also possible to maneuver the satellite before the enemy's spacetrack system can react and update its antisatellite targeting computations, thereby not permitting a successful attack. All of these defensive countermeasures help insure the warfighter that his space combat support will be there when he needs it.

Current US space doctrine calls for using on-orbit spares as a means to reconstitute capability. For instance, the Global Positioning System (GPS) will have 18 satellites in its constellation which is evenly spread over six orbital planes. There are to be three on-orbit spares so that three of the planes (every other plane) will have a fourth satellite vice three.

Constellations like GPS suffer system degradation gracefully under attrition. It is possible to lose several satellites and still have precise navigation for terres-

trial forces for a great portion of the time. Satellites can be reconfigured (moved within the constellation) to new positions in their orbital plane to replace a failing satellite.

In all reality, it is unlikely that a spare satellite could be built, launched, and operational in time to add much to a crisis. Consequently, our ground-based reconstitution capabilities are virtually non-existent.

### Denial

Denial is another basic tenet of space doctrine which relates to space control. One means of denial is defensive and the other is offensive.

Defensive measures to deny an adversary use of his space combat support systems would include operational deception plans to avoid detection or to exploit that detection with misleading information.

Offensive measures of denial are of the most importance to a warfighting CINC and his campaign planners. Offensive space control operations have a great potential for escalating the conflict, especially since the US finds itself without an operational antisatellite system.

Space lines of communication include the satellites themselves, the communication links, and the ground processing or receiving stations.

A theater commander might wish to deny an adversary overhead collection against US and allied forces. Today, the only means he would have is to target in theater those

command and control centers which receive the data either directly from the satellite or over some communication network.

Another option is to attack the adversary's launch sites or ground processing and data distribution sites. This definitely is escalatory, but it would deny reconstitution capability to the enemy. If the enemy's space systems were of short duration, then these operations would greatly impact the combat support he would have over the course of a protracted conflict. In this way, space control operations are similar to air interdiction operations in the air campaign.

The best course, given our present limitations in antisatellite capability, is to violently attack the adversary's command and control infrastructure, especially those centers where space mission data can be received over communication lines.

For a campaign planner, space doctrine governs both offensive and defensive operations. The planner must focus on those space combat support capabilities he needs for his air, land, and naval campaign and what his actions will be if these are disrupted or destroyed. He must also be sensitive to the escalatory nature of certain space control operations and how these might affect the conduct of the campaign.

In Chapter IV, a methodology will be presented to assist the warfighting CINC in building a space campaign plan within a global conflict scenario.



## CHAPTER IV

### SPACE CAMPAIGN -- GLOBAL SCENARIO

In order to develop a coherent methodology for space campaign planning in a global scenario, certain key assumptions must be made:

The methodology is presented from the viewpoint of a theater warfighting CINC (i.e., USCINCEUR, USCINCLANT, USCINCPAC, USCINCCENT, etc.).

Current global scenario is a multi-front conventional war with the Soviet Union.

US policy is to control escalation if possible and not introduce theater nuclear weapons at this time.

US forces are in a defensive role, but are mobilizing and massing forces to begin counteroffensive operations.

Theater CINCs are executing their base case war plans.

Current military objectives are to stabilize the situation in each area of responsibility (AOR) (wartime ROEs apply; no nuclear release authority given as yet).

Annex N (Space Annex) of the theater CINC's warplan gives in broad terms the role of USCINCSPACE as a supporting CINC.

The theater CINC has tasked his staff to build a theater campaign, to include a supporting space campaign.

Soviet naval forces have withdrawn to their bastions to support and defend their SSBNs; Soviet attack submarines have flushed in significant numbers into the North Atlantic and North Pacific.

Soviets have significantly increased their space order of battle, doubling the number of RORSATs, EORSATs, and imaging systems on orbit. The primary focus of ocean surveillance is Northern Atlantic/Pacific approaches to Soviet bastions. Imaging collection is increasing over the European central front.

As a theater CINC campaign planner, what are the most pressing space concerns and what support is needed from USCINCSpace?

#### Indications and Warning (I&W)

The most important I&W information for the theater CINC is warning of Soviet ICBM or SLBM attack on the continental US, or short range ballistic missile attacks (SS-21s) in theater, or nuclear detonations in the CINC's AOR.

This vital information is provided by USCINCSpace and passed to the theater CINC's command center as long as secure long haul satellite communication links are intact.

While USCINCSpace provides attack warning information from satellite and ground-based missile warning systems, he will also provide space threat assessments and SATRAN reports for those periods the CINC's forces are vulnerable. USCINCSpace will pass advisory notification of any space system degradation for those vital space combat support

capabilities the theater CINCs need for their campaign

### Space Combat Support

It is critical that the theater campaign planners coordinate with USCINCSpace for their combat support requirements early on. Most of our systems are robust. On-orbit spares can be activated and moved to constellation positions serving the direct needs of a theater CINC. Normal satellite constellation configurations can be adjusted to provide more coverage over a particular region for a particular period of time.

It must be remembered that rearranging system configurations to maximize coverage in one theater may degrade coverage in another theater. Therefore, these requests must be coordinated during the campaign planning phase -- it takes time.

The combat support available for planning is listed below:

| <u>Combat Support</u> | <u>Operating Agency</u> | <u>Available</u> |
|-----------------------|-------------------------|------------------|
| I&W                   | USCINCSpace/Intel       | 24 Hr/Day        |
| Intelligence          | Intel Community         | Priority         |
| Satcom                | DCA/USCINCSpace         | 24 Hr/Day        |
| Weather Forecast      | Global Weather          | 24 Hr/Day        |
| Navigation            | USCINCSpace             | 24 Hr/Day        |

The theater campaign planner should work through these capabilities and once appraised of their availability and system status, fold them into the overall campaign

plan.

USCINCSpace is the primary agent for warning, weather, and navigation space systems. The intelligence community works the national assets and the Defense Communication Agency (DCA) allocates satcom channels. Even though USCINCSpace flies the satellites. It's important that the campaign planning staff gets the right agency for the support. The tremendous coordination required to "get it right the first time" cannot be overstated.

### Methodology

The process to fold space considerations into a theater CINC's campaign plan is actually very straightforward. The outline presented below is an attempt to assist the campaign planner in making this happen.

#### I. Available Space Capabilities/Forces

| <u>Capabilities</u>      | <u>Forces</u>                     |
|--------------------------|-----------------------------------|
| A. Indications & Warning | AFSPACECOM      MW                |
| B. Intelligence          | Intel Community                   |
| C. Satcom                | DCA/AFSPACECOM                    |
| D. Weather               | Global      Weather<br>AFSPACECOM |
| E. Navigation            | AFSPACECOM<br>NAVSPACECOM         |

NOTE: "MW" is Missile Warning Sqdn

#### II. Enemy Space Threat Assessment

- A. Overhead Collection -- Surveillance/  
Reconnaissance/Targeting of Forces

- B. Operational Deception Plan to Counter Space Threat

### III. Space Strategy

- A. Maximize Blue Space Combat Support
- B. Attack Enemy Space Combat Support in Theater
- C. Replenish/Reconstitute Blue Systems As Required
- D. Protect/Defend Blue Space Combat Support Elements in Theater
- E. Maximize Use of Tactical Air/Ground Recce in Theater Due to Competition for Tasking National Assets

### IV. Employment

- A. USCINSPACE Will Employ Space Forces to Support Theater CINCs
- B. Intelligence Community Will Employ Forces to Assist Theater CINC J-2 Operational Intelligence Center
- C. Theater CINC/J-6 Will Insure Adequate Secure Connectivity With USCINSPACE and Intel Community for Passing Critical Mission Data or Intel Products

During the actual execution of the warfighting CINC's theater campaign, space combat support is not static and most likely will vary over the course of the war. It is imperative that the coordination and connectivity be made during the campaign planning phase so that as events occur, action can be taken to avoid some of the friction and fog of war.

Due to the great changes happening in the Soviet Union and in Eastern Europe, the likelihood of a global

war with the Soviet Union has greatly decreased. If somehow a war did occur, it would most likely escalate through the employment of theater nuclear weapons by the Allies or a Soviet antisatellite strike against some of our critical space systems or employment of the Soviet's own theater nuclear assets. In the event of escalation, US space strategy would be to attack the entire Soviet space infrastructure in the homeland (or in space if possible) in concert with other deep strike options directed by the NCA and carried out by the warfighting CINCs.

For the campaign planner, it is essential to maximize your own space combat support in the theater while tactically denying the enemy his capabilities when possible through violent strikes against enemy command centers and lines of communication.

If the war escalates and NCA so directs, USCINCSpace would execute a strategic space control campaign using available offensive forces in concert with other warfighting CINCs to deny the Soviets freedom of action in space and to eliminate their ability to wage space warfare.

There is an important aspect of winning the space campaign in a global scenario where the war has escalated beyond conventional means. Without space assets, the Soviets have no reasonable means to retarget their reserve nuclear forces -- they would not be able to assess the success of their strikes.

By the same token, if we lose the space campaign, we would have a similar dilemma.

In the next chapter, the methodology and process just presented will be applied to a regional scenario. Of the two, the regional scenario is the more likely challenge we will face in the future.

## CHAPTER V

### SPACE CAMPAIGN -- REGIONAL SCENARIO

To plan a space campaign for a regional scenario, certain key assumptions must be made similar in nature to those of the global scenario:

The methodology is presented from the viewpoint of a theater warfighting CINC.

Current regional scenario is a single theater, conventional war with a regional power that most likely has unconventional weapons, but little or no space combat support.

US policy is to control escalation and delay enemy use of unconventional means.

Theater CINC is executing a contingency plan for the region.

Current military objective is to stabilize the situation in theater and neutralize the offensive war-making capability of the enemy.

In the recent Desert Shield/Desert Storm campaign, we saw the tremendous force multiplying effect of a space campaign in which the US was the only player.

During the six month buildup, the US had in most cases excellent knowledge of the battlefield and the strategic infrastructure of Iraq's warfighting capability. The US knew the location and disposition of the main elements of the Iraqi armed forces. Our national assets



were able to pinpoint vital command and control nodes and these were targeted early on.

Missile Warning and Space surveillance squadrons played a key role in denying Iraq any military benefit from using its SCUD missiles. With each launch, warning was given in time for coalition forces and civilians to take shelter even though the time of flight for the SCUD was only minutes.

During severe weather and low overcast, the Iraqis were able to hide under the weather and relocate to fire the missiles along major highways. However, as soon as the missiles were fired, the USAF responded within minutes to suppress the missile forces. Although many of the mobile launchers got away, the SCUD suppression effort dramatically put those forces at risk and any that were slow getting away were destroyed. It is important to remember that it was our overhead space assets that enabled us to pinpoint the fixed SCUD sites and then our missile warning assets would pinpoint the mobile launch sites.

The Global Positioning System was another unsung hero in the Persian Gulf war. US ground forces procured every GPS receiver they could get their hands on. The vast desert areas where we operated had very little significant terrain or landmarks. GPS enabled large maneuver forces to maintain good command and control since even small units would know their grid coordinates within meters. GPS can even make our cruise missiles more effective by increasing the accuracy of their initial fix positions.

With GPS, Special Forces units are able to carry out deep missions requiring precise navigation in uncharted areas. As we gain more confidence in this precise navigation system, many of our weapon systems will be able to get an inflight GPS position update for their inertial guidance -- thus making our "smart" weapons even more lethal.

The benefit of having 24 hours a day weather forecasting was essential for conducting a successful campaign. With bad weather forecast, we were able to adjust the Air Tasking Order for more strikes using all-weather capable aircraft and more SCUD suppression flights since we knew the Iraqis could use the weather for cover to launch their missiles. Knowing the forecast also gave flexibility to the ground force commanders who would need fairly dry weather to start the high maneuver ground campaign. Without a good forecast, severe rainy conditions could slow down the tempo of the ground assault and even stall the campaign.

The last major force multiplier from our space assets was the tremendous amount of all source operational intelligence that was readily available in theater. Connectivity with external intelligence agencies and systems most likely figured prominently in the successful prosecution of the war.

For the theater CINC campaign planner, the regional scenario makes developing the space campaign much easier. Much coordination is still needed, but once in place, there is superb combat support available from our space forces. By using our national assets for intelligence

preparation of the battlefield, combined with the weather forecasting, precise navigation, secure communications, and missile warning capabilities enabled the US to require fewer air, ground, and naval forces and still retain an overwhelming offensive superiority.

Space is another dimension that enhances the combat effectiveness of our superbly equipped forces. In a regional crisis, it can be integrated with a land, air, and naval campaign in such a way as to enable the theater CINC to successfully pursue whatever mission the National Command Authorities chooses to give him.

## CHAPTER VI

### CONCLUSIONS AND OBSERVATIONS

In this paper, I have presented the campaign planner with the primary tools for building a space campaign to support the air, land, and sea campaign.

It is absolutely essential to use the space experts at United States Space Command to coordinate the space combat support that is available. It is also amazing how much we depend on space-based intelligence collection for theater preparation of the battlefield and the subsequent campaign against the enemy; we would not have nearly the effective combat power we do if we did not use our vital space assets.

During the Persian Gulf war, we employed our space forces to a maximum extent in support of an aggressive air, naval, and land campaign. The great success is directly attributable to a superb planning effort and brilliant execution.

I think it is unwise to imagine that we would ever again enjoy the luxury of taking six months to build and execute our campaign plans. What we can do, however, is to perfect the coordination process between the war-fighting CINCs and USCINCSpace so that space forces are factored in early alongside air, land, and naval forces.

In a global war, there will be great competition for the combat support provided by our space assets.

As these systems undergo attrition or degradation in a highly stressed combat environment, the theater CINC must plan his campaign accordingly -- making the most out of what he does have available. He can rest assured that USCINCSpace will be taking every measure possible to maintain and protect our systems while seizing opportunities to deny the use of space to the enemy.

For the more probable regional crisis, an aggressive space campaign can be decisive in supporting the warfighting CINC in his efforts to achieve national objectives through the employment of ground, air, and naval forces.

With adequate space campaign planning and coordination, the warfighting CINCs will be able to employ more combat effective forces with better results.

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